

REMARKS

Claims 1-4, 6, 8-17 and 19-21 currently appear in this application. The Office Action of July 30, 2007, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

What is claimed

A particular problem present in manufacturing transparent extruded products such as laminates, films and sheets that are made from polymers, mixtures of polymers, and compositions containing polymers, is the phenomenon known as "melt fracture." As described in the specification at page 2, lines 6-13, melt fracture occurs when styrene-methyl methacrylate polymers with styrene-butadiene polymers are subjected to extrusion processes to form sheets or films that are then thermoformed to obtain packages. The transparency of these polymers is reduced, since sheets made from these polymers may haze and even show windings which distort the shape and color of the products contained in the packages.

Melt fracture typically occurs during extrusion rather than in molded articles, which are typically injected rather than extruded.

In order to overcome the problem of melt fracture, applicant has developed (1) a random copolymer and (2) a polymer mixture of this random copolymer with a block copolymer. When this polymer mixture is processed by extrusion, the resulting products do not exhibit the melt fracture phenomenon, as mentioned at page 6, lines 1-18 of the specification as filed.

In the polymer mixture claimed herein, it is clear that the random copolymer is critical to making a polymer that is not subject to melt fracture. As claimed herein, the random copolymer is obtained and then mixed with a block copolymer. Thus, the polymer mixture (2) does not exhibit melt fracture when the mixture is processed by extrusion.

Amendments

The present amendment cancels claims 5, 7 and 18 and adds new claims 19-21. Support for claims 19-21 can be found in the specification as filed at page 6, lines 13-31 and in the example section of page 8.

The limitations of claims 5 and 7 have been incorporated into claim 1.

Claim Objections

Claims 1-4, 7, 9, 12, 14, 16 and 18 are objected to because of informalities.

It is believed that the present amendment corrects these informalities in accordance with the Examiner's helpful suggestions.

Claim 11 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and/or cannot depend from any other multiple dependent claim.

Claim 11 has been amended to depend solely from claim 1.

Art Rejections

Claims 1 and 3-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Biltech et al., U.S. 4, 772, 667, hereinafter Biltech'667. This rejection is respectfully traversed.

Biltech'667 discloses a thermoplastic polymer obtained from a feed composition comprising:

- (a) 25-75 parts by weight of a styrene monomer;
- (b) 10-50 parts by weight of methyl methacrylate;
- (c) 7-30 parts by weight of butyl acrylate; and
- (d) 2-20 parts by weight of a block copolymer.

Biltech'667 does not prepare a random copolymer prior to preparing the thermoplastic polymers. The thermoplastic polymer of Biltech'667 is obtained by polymerizing all of components (a) to (d) at the same time. The polymerization product of Biltech'667 has a gel residue that represents from about 8 to 30% of the initial components (column 4, lines 42-53). In contrast thereto, no such gel residue is formed in the herein claimed random copolymer, as shown in Examples 1-7, in which it is stated that any unconverted monomers were withdrawn by devolatilization in a vacuum chamber prior to palletizing the random copolymer.

Biletch obtains a heterogeneous product having a "salami" morphology with butadiene particles (spheres). Figure 1 shows a cross section view of a rubber particle with "salami" morphology that corresponds to Biletch invention.

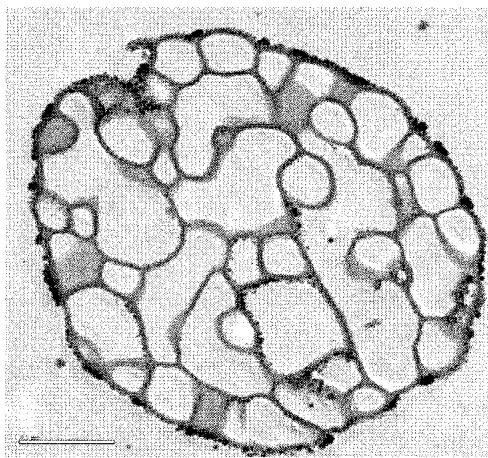


Figure 1

Figure 2 shows a photograph of the polymer mixture of the present invention having a totally different morphology to that observed in Figure 1. The morphology of the present invention is caused by the high amount of block copolymer and because of the fact the polymer mixture is obtained at an extruder. In figure 2 vast domains in the shape of layers can be observed.

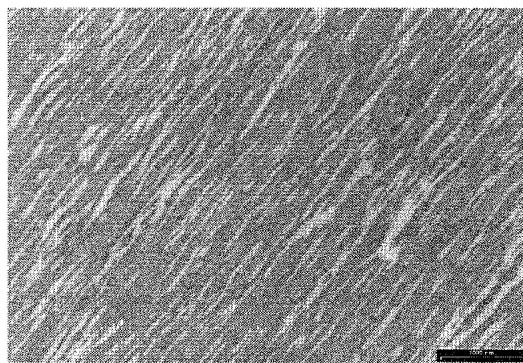


Figure 2

Claims 1 and 3-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Biltech et al., U.S. 4,680,337, hereinafter Biltech'337. This rejection is respectfully traversed.

Biltech'337 produces a polymer by polymerizing together the following ingredients:

- (a) 25-75 parts by weight of a styrene monomer;
- (b) 7-30 parts by weight of butyl acrylate; and
- (c) 2-20 parts by weight of a block copolymer.

That is, as in Biltech'667, all of the monomers are polymerized together. This is not at all the same as the random copolymer claimed herein.

Claims 1-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Morita et al., U.S. 6,310,148. This rejection is respectfully traversed.

Morita discloses a styrene resin comprising:

- (a) a copolymer (A) of a styrene monomer and an acrylic monomer as a matrix phase; and
- (b) rubbery polymer particles (B) which comprise
 - (1) a rubber diene polymer, (2) a styrene monomer and (3) an acrylic polymer.

In copolymer (A), the ratio of styrene/acid alkyl ester is from about 95/5 to about 50/50. In other words, the styrene is present in amounts from about 50 to 95%, while the ester is present in amounts from 5 to 50%. Morita only uses two components for copolymer A, while the presently claimed random copolymer comprises three components. Moreover, the random copolymer claimed herein does not have the morphology disclosed by Morita as particles of rubber in a matrix phase.

Morita manufactures styrene resin by polymerizing a conjugated diene, or a styrene copolymer of a diene monomer; a styrene monomer, and a methzcrylic acid ester. This polymerization is conducted in a specific manner to obtain the

morphology of the product. That is, Morita discloses graft polymerizing a styrene monomer and a (meth)acrylic acid alkyl ester with a mixed rubbery polymer containing two specific rubber components dissolved therein so that the median diameter of dispersed rubber particles is reduced. There is nothing in Morita that anticipates the random copolymer as claimed herein.

The following table illustrates the differences between the random copolymer as claimed herein and the polymers disclosed by Biltech' 667, Biltech' 337 or Morita:

	PRESENT APPLICATION	BILETCH '667 or '337	MORITA '148
A random copolymer comprised by three components is disclosed?	YES	NO	NO
Composition of the polymer mixture or thermoplastic polymer, which can be processed for manufacturing laminates or films	a) 1-75% of the random copolymer b) 25-99 of a block copolymer	$\left\{ \begin{array}{l} \text{- 75-95% of styrene monomer} \\ \text{- up to 15% of methacrylate alkyl} \\ \text{- up to 25% of acrylic alkyl} \end{array} \right.$ a) 25-75 parts by weight of styrene monomer b) 10-50 parts by weight of methyl methacrylate c) 7-30 parts by weight of butyl acrylate d) 2-20 parts by weight of a block copolymer	Copolymer (A) 95-50 of styrene monomer 5-50 of methacrylic acid alkyl ester In some examples it is mentioned a rubber average content from about 9 to 10%
Process for manufacture the polymeric mixture or thermoplastic polymer	Mixing in an extruder for obtaining pellets of the mixture	Polymerizing all components in a reactor.	Polymerizing all components in a reactor.

From the above table, it can be seen two differences. The first difference is that the cited patents do not anticipate the random copolymer; the second difference is that the block copolymer (rubber) amount used in the cited patents is less than that used in the applicant's invention. Finally, the present invention has a good elongation range as can be seen from table 4 of the instant application; elongation is a key factor for extrusion.

Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biltech'667 or Biltech'337 or Morita independent in view of Toya et al., U.S. 6,107,411.

As noted above, claims 13-17 are directed to a mixture of the random copolymer of claim 1 and at least one diblock or triblock copolymer containing styrene monomers or mixtures thereof. This mixture makes it possible to obtain laminates and films having a thickness of from about 0.254 to 2.032 mm by extrusion. The laminates or films obtained using this mixture have good elongation and excellent surface and optical properties. The laminates are ideal for use in thermoforming processes for producing blister packages.

As discussed *supra*, neither Biltech patent nor Morita discloses a random copolymer mixed with a block copolymer. None of the cited patents alone or in combination

suggests first obtaining a random copolymer and then creating a mixture of this random copolymer with a block copolymer.

Toya merely discloses manufacture of thermoshrinkable laminates having a particular average molecular weight ratio between a vinyl aromatic hydrocarbon and a conjugated diene. The laminates obtained are very thin, ranging from about 10 to about 300 microns, which are not appropriate for manufacturing thermoformable laminates for blister packages.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biltech'667 or Biltech'337 or Morita independently in view of Toya as applied to claim 13 above, and further in view of Kanno et al., U.S.C. 6,153,698.

As claim 18 has been cancelled, this rejection is now moot.

It is noted that the "X" references cited in the international search report and not cited herein have been considered but were not deemed applicable.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

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Respectfully submitted,

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